Ultrasonographic Characteristics of Frontal Fibrosing Alopecia

Sir,

Frontal fibrosing alopecia (FFA) is a primary cicatricial alopecia of unknown etiology that characteristically affects postmenopausal women.[1] Ultrasonography (US) is a fast, noninvasive imaging technique with increasing applications in dermatological pathologies.[2,3] Elastography is the technique by which ultrasounds are used to detect changes in tissue elasticity, assessing tissue stiffness without the need for skin biopsy.[4]

We conducted a prospective observational study with the aim of describing ultrasonographic characteristics of FFA. Clinical information (age, duration of disease, and sex) and ultrasound features were collected (B-mode ultrasound, elastography, color Döppler ultrasound, and XFlow). Ultrasound images were always taken at the level of the active frontal hairline. Esaote MyLab™ ultrasound system with a 22-MHz probe was used for all measurements.

In total, eight patients and three controls were recruited [Table 1]. Seven (87.5%) patients were women. The average thickness of the subepidermal low-echogenic band was 0.56 mm (0.34–1.1 mm), the average thickness of the dermis was 1.46 (1.1–2.7 mm), and the average thickness of the hypodermis was 3.65 mm (2.1–6.2 mm). An ultrasound sign of the frontal vein was found in 75% of patients. Hypoechoic perifollicular thickening was observed in 5 (62.5%) of the 8 patients. Color Döppler study showed increased dermal flow in 40% of cases. XFlow study showed an increased dermal capillary circulation in all the patients. Finally, elastography was performed in five patients and three controls evaluating the strain ratio (the rigidity of the structure under study with respect to the surrounding parenchyma) and found no difference in tissue stiffness ($P = 0.4$).

Perifollicular inflammatory infiltrate typical of FFA probably corresponds to the hypoechoic perifollicular thickening that we observed in B-mode US. Depression of the frontal veins is a clinical sign associated with FFA consequence of dermal fibrosis and venous dilatation.[5] It is not present in all patients and seems to be associated with a worse prognosis. We found that 75% of patients had this ultrasonographic sign. Interestingly, only two patients had a clinically visible depression. Although the description of this sign specifies that the dilated vein is at the hypodermic level, we found the dilated frontal veins at the reticular dermis or dermo–hypodermic junction. It is possible that US allows observing this phenomenon early and therefore before the fibrotic process ends up displacing the vein to the hypodermis deeply and clinical depression is observed. Unsurprisingly, due to the inflammatory nature of this disease, we found increased dermal flow in Döppler and XFlow mode. Finally, we did not detect an increased dermal stiffness at the frontal hairline compared to controls. This fact could indicate that the fibrotic process at the active

Table 1: Clinical and ultrasonographic characteristics of the patients

Patient	Age	Duratoin of disease (months)	SLEB (mm)	Dermis thickness (mm)	Hypodermis thickness (mm)	Hypoechoic perifollicular thickening	Ultrasonographic sign of the frontal veins	Döppler	XFlow	Elastography (strain ratio)
1	46	6	1.1	1.3	3.7	Present	Present	NP	NP	NP
2	82	40	0.34	1.2	3.1	Present	Present	NP	NP	NP
3	73	21	0.9	1.3	2.3	Absent	Absent	Negative	NP	NP
4	66	19	0.4	2.7	6.2	Absent	Absent	NP	Positive	1.81
5	52	8	0.7	2.1	5.5	Present	Present	Negative	NP	1.73
6	50	13	0.44	1.6	2.9	Absent	Present	Negative	Positive	2.55
7	70	38	NP	1.1	2.1	Present	Present	Positive	Positive	2.32
8	77	36	0.65	1.4	3.4	Present	Present	Positive	NP	1.95

SLEB – Subepidermal low-echogenic band; NP – Not performed

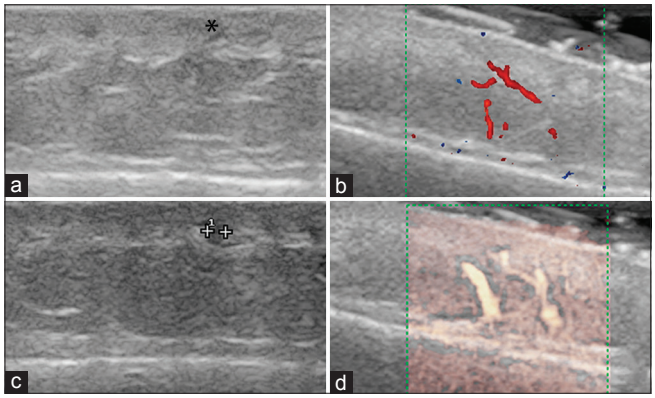

Figure 1: Ultrasonographic sigs of frontal fibrosing alopecia. (a) Hypoechoic perifollicular thickening (asterisk). (b and d) Increased dermal flow (b: Döppler color mode) and (d: X-Flow mode). (c) The ultrasonographic sign of a frontal vein (B mode)

hairline is not an early finding and is only present at the primitive hairline.

In conclusion, the ultrasonographic signs associated with FFA [Figure 1] are the hypoechoic perifollicular thickening, increased dermal vascular flow, and the presence of one or more frontal veins at the dermo–hypodermic level. Elastography does not seem to be a good tool for the early diagnosis of this disease. Prospective longitudinal studies with larger sample size are needed to better characterize the natural ultrasound history of this disease.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Access this article online

Website: www.ijtrichology.com

DOI: 10.4103/ijt.ijt_58_19

Quick Response Code

How to cite this article: Moreno-Arrones OM, Alfageme F, Alegre A, Roustan G. Ultrasonographic characteristics of frontal fibrosing alopecia. Int J Trichol 2019;11:183-4.

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